Draft

BEAR CREEK
Total Maximum Daily Load (TMDL) For Sediment
Truckee River Hydrologic Unit (635.20), Placer County
Updated May 2003

OVERVIEW

Section 305(b) of the Clean Water Act (CWA) mandates biennial assessment of the nation's water resources, and these water quality assessments are used to identify and list, as impaired, those waters which are not achieving applicable water quality standards. The resulting list is referred to as the 303(d) list. The CWA also requires states to establish a priority ranking for these impaired waters and to develop and implement TMDLs. A TMDL specifies the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and it allocates pollutant loadings to point and non-point sources such that those standards will be met.

Bear Creek was first included on the 1991 Section 303(d) list as impaired by sedimentation and siltation. The data that supports this listing includes a 1976 report, Siltation Evaluation for the Lake Tahoe Basin, prepared by the State Water Resources Board and the Lahontan Regional Water Quality Control Board (RWQCB). The Siltation Evaluation concluded that street and parking lot run off from Alpine Meadows Ski Area was carrying silt and nutrients to Bear Creek. Snow disposal operations from the parking lot were identified as the most likely source for the pollutants in question. Snow removal at the time involved storing snow either near the stream banks, or directly in Bear Creek. In addition to Alpine Meadows snow disposal management practices, a snowmaking pond embankment failed on December 6, 1988, discharging approximately one million gallons of sediment laden water directly into Bear Creek.

PROJECT AREA DESCIPTION

Geography

Bear Creek, a tributary to the Truckee River, is located in Placer County, 6 miles northwest of Tahoe City. The watershed is approximately 9 square miles, encompassing U.S. Forest Service (USFS), California Tahoe Conservancy (CTC) and private land holdings. The upper reaches of this watershed primarily consist of bedrock with wide bowls of alluvial deposits that are volcanic in origin. Watershed elevations range between 6,200 feet and 8,600 feet.

Water body Description

Bear Creek drains the Alpine Meadows Ski Area, and flows southeast from its headwaters to the confluence with the Truckee River, approximately 3.0 miles downstream. The flows in Bear Creek fluctuate significantly, with peak flows attributed to snowmelt runoff and/or rain on snow events. Most commonly, the peak flows take place between late fall and early spring.

Land Use

Alpine Meadows Ski Area, surrounding the headwaters of Bear Creek, on USFS and CTC land, is one of the principal land users of the upper Bear Creek watershed. Alpine Meadows has 14 lifts in operation, 2,000 acres of skiable terrain, three snow making ponds, a base lodge development, and two parking areas. At the midstream location, private land holdings and housing developments span more than half the reach of Bear Creek. In the lower portion of the watershed, the USFS also permits a seasonal horse packing station, which houses an estimated 35 horses for recreational riding. Other recreational activities may include hiking and mountain biking.

303(d) LISTING BASIS

Beneficial Uses

Bear Creek beneficial uses compiled in Table 2-1 of the 1995 Water Quality Control Plan for the Lahontan Region (Basin Plan) are as follows:

- Municipal and Domestic Water Supply (MUN)
- Agricultural Water Supply (AGR)
- Industrial Service Water Supply (IND)
- Groundwater Recharge (GWR)
- Rec-1, Water Contact Recreation (REC-1)
- Rec-2, Non-contact Water recreation (REC-2)
- Commercial and Sports Fishing (COMM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction and Development (SPWN)

Water Quality Standards

A variety of numeric and narrative water quality standards that apply to all surface waters of the Lahontan Region are listed in the Lahontan RWQCB Basin Plan. Specific numeric water quality standards at the mouth of Bear Creek are also listed as follows:

Constituent	Concentration*
Total Dissolved Solids	65mg/L
Total Nitrogen	0.15mg/L -N
Total Kjeldahl Nitrogen	0.10mg/L-N
Total Phosphorus	0.02mg/L-P
Chloride	2.0mg/L
Sulfate	2.0mg/L
Turbidity	3 NTU

*Mean of Monthly Means (MOMM): the arithmetic mean of the 30 day averages for the period of record.

In addition to the above numeric objectives, a narrative objective requires that waters shall not contain suspended materials in concentrations that cause a nuisance or that adversely affect the beneficial uses.

Beneficial Use Impairment
Bear Creek is listed as impaired by sedimentation and siltation due to a former snow-making pond dam break and past snow removal operations at Alpine Meadows Ski Area. In response to these issues, Waste Discharge Requirements (WDRs) were adopted for the Alpine Meadows Ski Area by the Regional Board on March 17,1976, Board Order No. 6-76-32. The most recently revised WDRs, Board Order No. 6-00-73 requires Alpine Meadows Ski Area to comply with the Basin Plan water quality standards listed above. The most significant beneficial use impairment is to aquatic life and spawning habitats that have negative effects on recreational uses, sports fishing, and wildlife habitats.

Status
The Lahontan RWQCB will be evaluating currently available data and collecting additional watershed information to determine the appropriate response to resolve the listing of Bear Creek for sediment. The following information is currently available:

Water Chemistry
Surface water data have been collected from the upper reaches of Bear Creek between 1986 and 2001. The bulk of the data are from surface water samples collected below the Alpine Meadows Ski Lodge and downstream of the parking area at Ginzton Road. For the time period above, the Basin Plan water quality standards for turbidity have been met.

Surface water samples collected below the Alpine Meadows Ski Lodge and at Ginzton Road were also analyzed for Suspended Solids (SS). The mean SS concentration for samples collected between 1986 and 2001 was less than 5mg/L. These data will be evaluated with respect to available literature values for the protection of aquatic life.

Bioassessment
The primary objective of the bioassessment surveys is to provide information regarding benthic (stream bottom) community structure and their physical habitat conditions. These assessments can be used as a watershed monitoring tool and provide valuable information on cumulative effects of upstream land and water use activities.

Two different bioassessment studies took place in Bear Creek during 2000 and 2001. Contracted through the Lahontan RWQCB, Dr. David Herbst with the Sierra Aquatic Research Laboratory (SNARL) performed an assessment in both the 2000 and 2001 seasons in the lower potion of Bear Creek above the confluence with the Truckee River. Ian Chan, a private Aquatic Ecologist from Tahoe City contracted by Alpine Meadows Ski Corporation, sampled three locations: the upper, middle, and lower reaches of Bear Creek. The preliminary findings for both of these bioassessment evaluations provide evidence of good to moderate water quality conditions.

Watershed Assessment

When normalized for area, the *Water Quality Assessment and Modeling of the California Portion of the Truckee River Basin* (Desert Research Institute, July 2001) finds Bear Creek within the top three sub-basins contributing the highest sediment loads to the Truckee River.

SCHEDULE

2/03 - 6/05: Engage Stakeholders/conduct outreach
7/03 - 9/04: Watershed assessment
10/04 - 3/05: Draft Technical TMDL
4/05 - 9/05: TMDL and proposed implementation options
3/06: Regional Board action

CONTACT INFORMATION

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